CHAPTER-II

THE STUDY AREA

2.1 INTRODUCTION TO THE STUDY AREA

The study area of this work includes the Hajo Community Development Block within the Kamrup District of Assam. It is a part of the Lower Brahmaputra river basin composed of the new alluvial deposits carried by the mighty Brahmaputra and its tributaries - the Puthimari river, the Baralia river and the Sessa river.

Situated on the north bank of the river Brahmaputra, this block covers half of the northern part of the Kamrup district of Assam. It is surrounded by the Kurijini and the Chaulkhowa rivulets in the north, the Ajnathuri hill in the east and the Nalbari district in the west.

The block extends from 26°10' N to 26°20' 5" N and 91°40' E to 91°40' E. The maximum east-west extension is 22.2 km while the north-south extension is 19.2 km. It is almost circular in shape ((fig. 1.2).

It has a total geographical area of 360.7 km² (36070 hectares). The region comprises seven Gaon Panchayats (GP), which are considered as micro level spatial units for the purpose of this research work, four mouzas and 135 revenue villages according to 1972 Panchayat Act. Out of these one hundred thirty-five revenue villages, ten are uninhabited. The block is under the Guwahati Civil Sub-division in Kamrup District of Assam. The rural area covers 352.68 km² (35268 hectares) representing 97.78 per cent and the urban area represents the remaining 2.22 per cent of the total geographical area.
The very location of the study region on the fringe of the Guwahati city exhibits rurban character as a result of outward growth of the city. The rurban community as a whole is undergoing a significant transformation in socio-economic and socio-cultural milieu. As most of the villages of the block are located near a growing city, the pattern of changes are multi-faced. It is related not only to the socio-economic but also to the behavioural aspect of the people.

2.2 PHYSIOGRAPHY

The area as a whole is considered as plain representing a part of the lower Brahmaputra Valley, the land surface being sloping gradually from the north to the south up to the north bank of the Brahmaputra. The elevation of the northernmost part is 61 metres above mean sea level on the average and that of the bank of the river Brahmaputra in the south is only 46 metres. But the topographic variation along the east-west direction is insignificant.

Geomorphologically the area is an aggradational plain, built-up by the depositional works of the Brahmaputra and its tributaries. The study area comprises patches of plains, isolated hillocks and char lands formed by the braided river Brahmaputra. Geologically it is built by the deposition of alluvium upon a sag formed during the period of the rise of the Himalayas. Another interesting geomorphological feature of the valley is the presence of a good number of isolated hillocks or monadnocks detached from the Meghalaya Plateau by the degradational work of the river Brahmaputra.

Most of the streams and rivers of the region have had their origin in the Bhutan Himalaya, and they have been flowing in almost north-south direction. But
before finding their ways into the Brahmaputra, they run in parallel courses to the main stream and encounter its levees leading to formation of good number of *beels* and huge marshy tracts as a result of their conspicuous meandering courses. The block comprises the built-up active floodplain and swamps.

Physiographically the region may be divided into three distinct physiographic zones running sub-parallels to the Brahmaputra river. These are:

(i) The Northern Built-up Plain with Swamps and *Beels*

(ii) The Active Floodplain

(iii) The *Charlands*

(i) The Northern Built-up Plain with Beels and Swamps:

The Northern Built-up plain with *beels* and swamps is a relatively high middle ground lying all along the south of the fairly flat Tarai Belt. This zone extends for about 18-20 km. This is comparatively fertile due to the presence of both old and new alluvial soils deposited by the tributaries of the Brahmaputra like Chaulkhowa, Puthimari and to a lesser extent by Sessa river. The gradient of these zones is very low as a result of which the rivers flowing through this zone cause occasional floods in the rainy season. The meandering nature of the streams gives rise to numerous lakes and marshes. Most of them are shallow and not of considerable sizes. These lakes or swamps are locally known as *beels*. Several small streams locally known as *Jan* or *Suti* originate in these *beels* and flow through this region till they meet a river.

At the far south-east of the study region there is a depressed area consisting of a chain of beels like Deghali, Pandhoba, Bhakua, Barkuru and Kurijine. Bagadhoba and Durimari *beels*. This chain of marshy lands lies at the foothills of Ajnathuri hill.
From the south of the Baramboi hill in the north-east to the far west border of the block there lies an extensive chain of beels and swamps. Important beels of this region are Itani, Chatala, Satdala, Kayajeni, Mellora, Gaurijan, besides various marshes and swamps. To the south of this chain, another concentration of beels and swamps are found in and around the Hajo township which are economically more viable for their favourable geographical location. Among these, Panikhati, Pateni and Honka beels are notable. In between the two built-up tracts of high ground, namely Dampur-Bongshar tract and Soalkuchi-Bathan-Srihati tracts, there lies a geographically important marshes of large size known as Nite beel. It extends from Soalkuchi, Bathan and Srihati in the South to Dampur and Bongshar in the north comprising an area of about 18 sq.km. Barbila and Sarubila are two other important beels located at the southern part of the study area which are occasionally inundated by the Brahmaputra at the time of high flood in rainy season. This belt is fertile due to the presence of old and new alluvial soils deposited by the river and tributaries of the region. The gradient of this zone is very low as a result of which the rivers flow through this zone cause occasional floods in the rainy season. Sometimes flood may be menacing to agriculture, but one good aspect of them is that they replenish the agricultural fields with the deposition of the fertile silts which enhances the natural fertility of the soil. This is why this built-up zone becomes a rich rice growing region with a high population density. Most of the roads and settlements are concentrated in this built-up plain.

(ii) The Active Floodplain

The area between the built-up plain and the northern bank of the Brahmaputra including the whole western part of the block is a moderately high and extensive plain
spreading north-west to south-east. Geological history and geomorphological
evidences reveal that this belt had been built up on the river basin of the Brahmaputra
which had been left in the pre-historic era. Identity of this ancient course of the
Brahmaputra can be assumed from mythological evidences. Ananta-kandali, a
renown litérature of ancient Assam rightly pointed out in his Assamese version of the
Ramayana that the river Brahmaputra was flowing near the foothill of Manikut hill
where the Hayagrib Madhav temple is located. The name of the village Ekdatia
indicates that once it was a bank of the river. The term “dati” means bank of a river.
Another mythological saying is that this extensive area from Manikut hill and
Dowani Mowani hills in the north to Ekdatia and Dampur hill in the south was said to
be the Kakrai Sagar. This mythological faith is also supported by the facts that most
of the villages within this belt bear the names ending with the word ‘dia’. The term
dia represents the landmass in the active floodplain of the river. They are of very
recent formation and by and large formed by the new alluvium. So the villages like
Tokradia, Ramdia, Bongshardia, Hardia, Khetrihardia, Nadia all indicate that these are
of riverine origin. This belt is fertile due to the presence of new alluvial soil deposited
by the Brahmaputra and by its tributaries which drain through the region. Most
important geomorphological phenomenon that developed in the recent past is that the
beels and swamps have been silted up by the floods of the Puthimari and Sessa river
combined with the back waters of the Brahmaputra. As a result one may observe
green agricultural fields in the erstwhile beels and swamps during autumn season
now-a-day.

A chain of discontinuous hillocks are notable geomorphic features that are
located on the northern bank of the river Brahmaputra running almost parallel to its
These hillocks of almost equal elevation are standing here and there like monadnocks in peneplains. The chain is almost continuous from the Ajnathuri on the east to Hatimura on the west including other hillocks like Gandhamadan (93.58 m), Ramboi and Sidheswari. Other hillocks are located towards north of this chain. To the north of these chain lies the Bongshor-Dampur strip of hillocks. This chain comprises Bringeswar hill (176.06 m), Sanpara (145.85 m) and Dampur hills (140.0 m). To the south of the built up plain lies a chain of hillocks among which Allabhoi hill (46.0 m) and Ganesh hill (45.72 m) of Pacharia, Dowani-Mowani hill (68.89 m), Hajo R.F. (45.72 m), Powa Macca (231.65 m) and Kulhati (16.94 m) are worth mentioning. This chain of hills also represents the northern demarcation line of the active flood plain zone.

Boromboi hill (46.0 m) and Malong hill are the lone hillocks that are located on the northern and north-eastern boundary of the block respectively.

It is found that about 3.9 per cent of the total geographical area lies above 60 m contour, 6.60 per cent of the total area being covered by permanent water bodies viz. rivers, beels and swamps below 50 m contour and 49.2 per cent of the area are found to be between 55 m - 60 m contours and 40.3 per cent between 50 m - 55 m contours.

(iii) The Charlands

A significant physical characteristic of this region is that the river Brahmaputra is highly braided in this region due to its low gradient. As a result there are various riverain islands inside the river course of the Brahmaputra. It includes all the river islands of the Brahmaputra within the territory of the block. This belt as a whole is a low-lying one flooded by the river waters every year and termed as floodplains of new alluvium and silts. This transitory river islands and lowlands in the middle of the
Brahmaputra are called *charlands* or *chapari* which are formed by the deposition of detritus in a certain year and may remain in thin existence for some years but suddenly may disappear due to the river erosion. They generally remain above the water level during the winter season but submerged under water during the summer flood season. So they are suitable for agriculture only for *rabi* crops during the winter season and the peasants have to abandon these lands during the summer season. These lands earlier occupied by the indigenous peasants and gradually abandoned by them later on have been gradually settled by the immigrant Muslim peasants and as a result insignificant areas are left vacant now. This leads to marked decline of grazing lands and dairy farming.

**2.3 DRAINAGE AND WATERBODIES**

The mighty Brahmaputra river that flows along the southern border of the block is the main drainage of the region. Other important rivers that intersect the region are Puthimari river and Sessa river, which flow sub-parallelly to the Brahmaputra. They originate in the Bhutan Himalayas and meet the Brahmaputra in the south. The plain of the study area is the creation of these two rivers and that of the Brahmaputra. Though these rivers cause flood havoc in most of the areas, fertile agricultural fields are built up by the deposition of alluvial soils and silt during the floods.

The river Sessa has different names at different places. On its way to the estuary at the Brahmaputra, it is called ‘Kalajol’ in Kamalpur and ‘Mudunkani’ in Borka, ‘Kurijini’ near Alabai, “Sessa Noi’ near Kulhati and Sessamukh. Again it is known as ‘Kalajol’ near Bongshar. From Bongshar to the west it is called ‘Hajo Suti
Noi’. From Athiabari to its north, the river flows meandering and meets some small streams or rivulets locally known as ‘jans’.

Puthimari is another important braided river of the region which originates in Bhutan Himalayas and flows through the area with a good number of tributaries. It also takes different local names at different places. Beyond Boromboi, it is called ‘Barsala Nadi’ and near Hajo it is called ‘Lakhaitara’ river. Mowamari Nadi’ a tributary of the Pagladiya river is flowing through the western boundary of the block.

These rivers are flowing on the sandy beds along shallow channels. As a result, they frequently shift their courses. Water discharge of these rivers is often obstructed by the back flow of the Brahmaputra at the time of its high flood. The shifting nature of the river channels are also caused by the silting up of the rivers due to transportation of huge load of sediments from the Himalayas due to heavy rainfall upon loose structure of the rocks and soils of the catchment areas. Consequently, the tributaries have conspicuous meandering courses leading to the formation of beels and ox-bow lakes and huge marshy tracts. Flood-havoc is often caused due to these fluvio-geomorphic processes in the area.

2.4 SOIL

The soils throughout the length and breadth of the area are fertile. The region has two main types of soil - the old alluvium and new alluvium. The old alluvium is scattered in nature and present in the interfluves of both the Puthimari and the Sessa representing higher ground. Such soils are either blackish or brownish in colour and heavier than new alluvium. About 80 per cent of the total area of the block are made up new alluvial soil. Sandy loamy and black clay soils are found in the swamps, lakes, beels and marshes of the area. Red lateritic soil is found in hills and hillocks.
The hill region contains a higher percentage of nitrogen and organic matter. The hill soils lying over a subsoil of heavy clay are suitable for horticulture. Coffee plantation in the Bringeshar hill in the recent years is worth mentioning here. Heavy clay soils of the low lands with higher percentage of nitrogen are suitable for rice, wheat and pulses. The sandy loams lying in the floodplain of Brahmaputra and its tributaries are good for jute cultivation. New alluvium with sandy loams of the char areas are suitable for growing rabi crops such as vegetables and pulses. Sugarcane and jute are also grown suitably in such soil.

It is worth mentioning that Rakhani chapari of Singimari area, a fringe village of Guwahati city is not only famous for its high quality of brinjal but also for its large-scale production of all kinds of green vegetables to fulfill the needs of the city to a great extent. Barren and grazing lands with tall grasses, reeds and thatches are the heaven of milch cattle. As a result, dairy farming is successfully done in these char areas.

2.5 CLIMATE

The climate of this region does not differ from that of other parts of the lower Brahmaputra valley where monsoon type of climate prevails with four distinct seasons viz. (1) Pre-Monsoon, (2) Monsoon, (3) Retreating Monsoon and (4) Dry winter. Only minor variations are observed due to the presence of local orographic features.

In general, the climate is characterized by relative coolness, extreme humidity, heavy summer rainfall and winter draught. During 1979-1980, the mean temperature was estimated to be 22.67°C, the mean relative humidity 82.5 per cent and the average rainfall 1550 mm. Rainfall generally occurs for eight months in the year from
March to October with some variations. The Hajo Block along with the lower Brahmaputra valley as a whole receive almost 90 per cent of the total annual precipitation from May to October from the south-east monsoon and cyclonic rain.

The winter season starts from November and continues up to February. During this season, the weather is cool and pleasant with little rainfall. The average winter temperature varies between 11°C and 19°C. The average rainfall is less than 5 cm. January is the coldest month with a minimum temperature of 7.8°C. Winter season is characterized by a clear sky with occasional morning and evening fogs. The relative humidity of the area varies from 60 per cent to 90 per cent during the year, lowest being during February-March and highest being during June-July.

During the pre-monsoon period which starts in March and continues up to May is characterized by a type of squall, generally accompanied by violent thunderstorms and heavy rain and hail showers as a result of 'Nor-Westers'. Sometimes it may continue till the end of the rainy season. The average rainfall exceeds 15 cm.

The real monsoon period starts in the month of June and continues up to the month of September. This is the season of heavy rainfall and more than 70 per cent of the total annual rainfall is received during this period. The mean summer temperature of the area is found to be 27°C. The highest temperature is found during June and July experiencing a maximum daily temperature of 38°C.

By the middle of September, monsoon starts to retreat not only from the study region but also from Assam followed by a fair and cool weather of the Autumn season for three months. With the advance of the season, the temperature falls and morning mist and fog appear.
In some years the annual distribution of rainfall becomes so uneven that about 90 per cent of the annual rainfall occurs during the months of June, July and August creating natural calamity like flood which directly affects cultivation and yields of the *kharif* crops. On the other hand, *rabi* crops cannot be grown successfully during winter season when drought prevails creating scarcity of soil moisture which is very much essential for the growth and development of crops. Even during the summer season, monsoon may fall to such an extent that it causes summer drought also. This summer drought is menacing to the most important staple crop of the area, the *Sali* paddy. The irrigation facility which is highly essential for efficient cultivation of crops is too meager to meet the need of the peasants. As a result, there is a marked decline in production of food crops of the peasant at their subsistence level leading to acute shortage of food. Out of bare necessity, a good number of cultivators and agricultural workers have left cultivation and take some other kind of occupation in order to get rid of poverty and starvation.